University of Rochester

Syllabus for Data Science

Capstone/Practicum Project Course

Course Name:	Data Science Capstone/Practicum
Course Number:	DSC 383W / DSC483W (4.0 credits)
Class Times:	Tuesday & Thursday 4:50 pm- 6:05 pm
Class Room:	Gavett, 310
Instructor:	Prof. Ajay Anand, PhD
	(ajay.anand@rochester.edu)
	Prof. Pedro (PJ) Fernandez
	(pjfern2@gmail.com)
Office Hours:	Ajay Anand: Wednesday 1:00 -2:00 pm in Wegmans 1203
	PJ Fernandez: Tuesday 3:00 -4:00 pm in Wegmans 1219
	OR By Appointment
Course TA:	Yuexi Wang (ywang307@ur.rochester.edu)
Office Hours:	Thursday: 2 – 3 pm in Wegmans 1211

Course Description:

The Capstone provides an experience for senior-year Data Science majors and graduate students to apply the core knowledge and skills attained during their program to a tangible data science focused project. Students will work in small teams on a project that applies data science methods to the analysis of a real-world problem. The identified projects or problems and datasets will cover a range of application areas and reflect real-world

needs from industry, medicine, and government. Each student will be required to write a paper about their project, which will satisfy one upper-level writing requirement.

Course Goals:

- Students will demonstrate an ability to work on a real-world data science problem from data acquisition to final evaluation. In doing so they will acquire, clean, and explore data. Design models to solve the problem and evaluate their solutions.
- The course emphasizes applying various data science technologies and methods students have learnt and been exposed to in their curriculum on real-world problems.
- Students will learn how to work in small teams in a collaborative style.
- Students will demonstrate competence in writing data analysis reports (DAR) demonstrating the ability to bridge the gap between the technical language a data scientist is accustomed to and the language that a business representative can understand.
    - Students will write an individual report for the mini-project and contribute to team reports for the main capstone project. Collaboration is essential for a successful project, so each team member will contribute on the components they worked on.
- Students will demonstrate a working knowledge and use of basic project management practices with respect to data science projects.

Course Schedule and Outline:

(Will be posted on a Google Doc as a live link with updates)

Due to the nature of the course being dependent on projects from external sponsors the above outline is subject to change. Changes will be published as soon as is reasonable to minimize disruptions, but changes should be expected.

Grading Policy:

As a project-based course, the emphasis is on working collaboratively and interacting with the sponsors to meet the project deliverables. Demonstrate

the ability to apply data science techniques (from data preparation, exploratory analysis to modeling and communication) to achieve the goals of the project. Understanding and use of project management practices, class and team participation will constitute the other aspects of the grade. The artifacts produced in the course include written reports, code developed to apply the data science techniques, and presentations to the class and sponsors. Effective written and oral communication is essential to a data scientist since they are the ones responsible for translating the technical language of data science, mathematics and statistics into something that can be understood by business professionals and project sponsors.

For those enrolled in 383W (undergraduate course): As an upper level writing course, the written report will satisfy the writing requirements. A proportion of the grade for each written report is reserved for writing quality.

Guidelines for upper level writing: https://writing.rochester.edu/requirements/upperlevel.html#

Bibliography and other resources:

There is no required text book for this course. However, "Elements of Data Analytics Style" by Jeff Leek is highly recommended (http://leanpub.com/datastyle)

Please note the detailed grading criteria in the table below.

Grading Component	Details and Percent of Final Grade
Mini-project	• Individual Written report summarizing the work on the mini- project Grade contribution: **20%**

Main capstone project	(All are team deliverables, i.e. one submission per team) • Project charter/plan **(10%)** • Bi-Weekly progress reports **(15%)** • Final report **(20%)** • Presentation **(10%)** • Timely submission of final deliverables (code, readme) **(5%)**
Project Management, Team contributions	**(5%)** • Demonstrate use of data science project management practices. • Team member contributions
Attendance	**(15%)** Attendance at key milestones during the semester: Sponsor presentations (4 class periods), Final Team presentations (3), Class activities (team formation, project management lecture), Team meetings* (absence in one meeting is acceptable without penalty) *For MS DSC students, one of the team meetings will serve as Plan B exit exam (Details to follow) (Must be present within 15 minutes after start of class to receive full attendance. Otherwise, attendance is pro-rated) Excuses can be provided only for extenuating circumstances that are beyond individual control. Please discuss with the instructor as early as possible of potential absences.

All submissions are due at 11:59 pm on the assigned due date. Late penalty is 10% per day.

Academic Honesty Policy:
In all cases of suspected plagiarism or other forms of academic dishonesty, the College's procedures and policies governing academic honesty will be followed. This pertains to all work in writing courses, including (but not limited to) rough drafts, final drafts, presentations, and informal writing assignments. As required by College policy, all instances of academic dishonesty are reported to the College Board of Academic Honesty. For the complete College honesty policy, see http://www.rochester.edu/college/honesty/index.

Credit Hour Policy:
This course follows the College credit hour policy for four-credit courses. This course meets two times weekly for three academic hours per week. The course requires students to complete team projects to meet the capstone and practicum course requirements. These activities include group team meetings to discuss project tasks and deliverables of at least one hour per week. In addition, the students are expected to complete supplementary work averaging 8 hours per week. This includes meetings with project sponsors in person or via remote conferencing, individual effort on the project which includes developing algorithms, writing code, validating the results, and preparing documentation.